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ABSTRACT

The overall purpose of this study was to investigate the effectiveness and practicability of a home-centered preschool intervention program for cognitive, language, and personality development of mother and child, based upon the use of paraprofessional educators who are themselves members of the population served. One question considered was whether early child stimulation could have continuing effects as children reached school age. Subjects were healthy babies from indigent families whose mothers agreed to be visited once a week and to work with the parent educator. She also had to allow her child to go to the home learning center twice a week. The first two years of experimental treatment consisted of weekly home visits, some educational and some just "friendly." In the third year, intervention consisted of weekly home visits and experience in a group setting twice a week. Results of intensive testing of the subjects at age six showed that the intervention had long-term positive effects on the children. The most effective results were achieved with those children who were in the program continuously from age three months through three years. It was suggested that sustained gains resulted from changes in maternal attitudes and feelings about education, about the child, and about themselves. (Author/BRT)

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# The Florida Parent-Infant Education Program

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# The Florida Parent-Infant Education Program

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This paper is abstracted and adapted from the final report of the Home Learning Center Project (Gordon and Guinagh, 1974).

The purpose of the Parent Education Program at the Institute for Development of Human Resources (Gordon, 1967, 1969) was to investigate a home-oriented approach into intervention in the lives of very young children in a way which might break the poverty cycle. It attempted to raise the chances that a young child will reach a higher level of intellectual and personal development, and that the significant adult in his life will gain in competence and feelings of self-worth. The project was a combination of research and demonstration, containing phases of basic research, material development, and field testing of both materials and a delivery system.

The overall aim was to investigate the effectiveness and practicability of a home centered technique for cognitive, language, and personality development of mother and child, based upon the use of paraprofessional educators who are themselves members of the population served. This model represented an innovation in family services which, if effective, extended the reach of the professional, upgraded the competence and importance of the paraprofessional, and in the long run reduced the

need for such services as participants became more capable of meeting their own needs. The specific aims were to answer the following questions:

A. Can a home visit approach, using paraprofessionals as the key educators of parent and child, be carried out for children below the age of three?

B. Can intellectual and personality stimulation materials be developed which can be easily taught to the mother and child by paraprofessionals?

C. Does early child stimulation, provided through a program such as this, have continuing effects as youngsters reach kindergarten and the beginning of school years?

This paper will respond briefly to the first question, ignore the second question, and focus mainly on the third question.

The original program was entitled The Parent Education Project (PEP) (Gordon, 1967) and was a basic engineering effort to answer such practical questions as to whether a set of materials for mothers and infants could be developed and delivered on a weekly basis to the family by paraprofessionals. The PEP project had 150 experimental families and two control groups of about 30 each. One of the control groups was used to look at the issue of making a "friendly" visit versus making an educational visit. In this control group, graduate nurses visited the families on a systematic basis, but conducted no parent education. The purpose was to explore the Hawthorne effect of simply visiting. The other control group received only the posttest. This first effort lasted until the children were 12 months of age at which time they were tested.

The next project continued with the same families and worked with them until the children were 24 months old. This study was entitled Early Child Stimulation Through Parent Education Project (ECSPEP) (Gordon, 1969). In this study the original experimental group was divided and half were randomly assigned as a new control group. Since no significant difference was found between the two control groups in the previous study, both these groups were combined into a common pool, and half were randomly assigned to the experimental group in this study. This gave four different groups.

The families continued to be involved in the intervention program through the child's third year of life. However, there was an addition to the program. Up to this point all of the intervention had been of the home visit nature, on a once-a-week schedule. Now in addition to this home visit each child spent two hours twice a week in a home learning center (HLC) of five children. These were in homes of mothers in the project; they were a mixture of urban homes in the Gainesville area, and rural homes around the 12 county area. Each paraprofessional home visitor worked with ten families, so she met with two groups in the home learning centers. This completed the intervention, but data continued to be collected on the children through age six.

Sample

The original sample was identified at birth of the child by the Obstetrics staff of the Teaching Hospital of the J. Hillis Miller Health Center for the University of Florida. The criteria for selection, in addition to the economic code of "indigent" on the hospital admission form and residence in Alachua and 11 other surrounding counties were:

single birth, no breach or Caesarian delivery, no complications to the mother or infant, no evidence of mental retardation and no evidence of mother's mental illness.

New families were added into the longtudinal population beginning in November, 1968, in order to investigate the effects of training on children and mothers who had no previous exposure to the project. Criteria for the selection of the new population were less stringent than those for the original population. We did not secure any obstetrical or pediatric screening nor were the babies necessarily born at the health center; rather, they were recruited from families that met the OEO guidelines so that the economic background of the family was similar to that of the original group but we knew less about the health situation.

In order for the family to be in the program, the mother had to agree to be visited once a week and work with the parent educator. She also had to allow the child to go to the home learning center twice a week. The program was fully explained to the mother and written consent, in keeping with the Public Health Service rules on research involving human subjects, was obtained.

Treatment Plan

Table 1 indicates the treatment plan showing the various subgroups from 1966 to when the children were six years old. All the children were born between June 1, 1966 and November 1, 1967. The first two years of experimental treatment were in the PEP and ECSPEP programs and consisted of weekly home visits. The third year was in the HLC project and intervention was weekly home visits as well as experience in a group setting twice a week.

Table 1

Longitudinal Study - Treatment Design
Child's Age by Months

| Group | 3-12 | 12-24 | 24-36 | 48, 60, 72 |
|---|---|---|---|---|
| 1. all 3 years | Home visit | Home Visit | Home Learning Center/Home Visit | Test |
| 2. first 2 | Home Visit | Home Visit | Control | Test |
| 3. second 2 | Control | Home Visit | Home Learning Center/Home Visit | Test |
| 4. first & third | Home Visit | Control | Home Learning Center/Home Visit | Test |
| 5. first only | Home Visit | Control | Control | Test |
| 6. second only | Control | Home Visit | Control | Test |
| 7. HLC[1] | | | Home Learning Center/Home Visit | Test |
| 8. controls | Control | Control | Control | Test |

3-12 and 12-24 month phase supported by the Fund for the Advancement of Education (1966-67) and Children's Bureau, HEW (1967-69) (Gordon, 1967-69).

[1]Consisted of children recruited at age 2, not in previous control groups.

Results-Attrition

The first objective was to answer whether a program such as this using paraprofessionals as the key educators of parent and child, could be carried out for children below the ages of three. One of the obvious questions in any longitudinal study is the rate of the attrition of the subjects. Although the families were only in the intervention phase of the program while the children were between three months and three years of age, the design required evaluation at ages four, five, and six.

The attrition found was very low, as indicated in Table 2. Using the test given at age two, the Bayley Test of Infant Development, as 100%, 94% of the children in the study (including controls) were still involved at one year later when the children took the Stanford-Binet at age 36 months. (The increase in group seven is because two children missed the Bayley although they were in the HLC.) After 36 months, there was no more intervention, and follow-up testing was done on the children's birthday at ages four, five, and six.

Several factors encouraged the parents' cooperation. The mother was given $2.00 for participating in testing. All children were picked up with their parents by the same driver and brought into the testing site. These factors probably helped in keeping the testing attrition rate so low between ages three and six. Some parents who moved and missed a testing called us the next year when they had moved back to tell us they wanted their child to be tested. This is what happened in group six when only 15 children took the test at age four, but 16 took the test at age five. Most parents also seemed to feel that this was an important and interesting activity for their child and wanted to be a part of it.

Table 2

Attrition by Treatment Group

| Group | years | Number of Children Taking Test At | | | | |
|---|---|---|---|---|---|---|
| | | 24 months | 36 months | 48 months | 60 months | 72 months |
| 1 | all 3 | 27 | 24 | 23 | 26 | 26 |
| 2 | first 2 | 14 | 12 | 14 | 12 | 11 |
| 3 | second 2 | 12 | 12 | 9 | 9 | 8 |
| 4 | first & third | 12 | 11 | 11 | 11 | 9 |
| 5 | first only | 11 | 10 | 10 | 11 | 11 |
| 6 | second only | 18 | 16 | 15 | 16 | 13 |
| 7 | HLC | 55 | 57 | 52 | 51 | 50 |
| 8 | controls | 55 | 50 | 52 | 52 | 51 |
| Total | | 204 | 192 | 186 | 188 | 179 |
| % of entering | | 100% | 94% | 91% | 92% | 88% |

Results-Longitudinal Findings-Stanford-Binet

The third question, does early child stimulation provided through programs such as this have continuing effects as younsters reach kindergarten and the beginning school years, is answered below.

At age six, all children were measured on three instruments: The Stanford-Binet, The Caldwell Preschool Inventory, and The Task Oriented Behavior Scale. The first two tests are cognitive measures, and the last is a measure of involvement or effort in taking the test. Only the results for the Stanford-Binet will be presented in this paper.

Several samples were used to do statistical analyses. Two of these different samples will be presented here. Table 3 gives the results on the Stanford-Binet for all six year old children who took this test (N=179). Table 4 gives the result for children who had the Bayley at age two and the Stanford-Binet at ages three, four, five and six (N=142).

The sample-size varies with each of these groups. The different groups have been analyzed in order to see if differences might appear if different criteria were used for the data. Keeping out children from the data who were not present for testing each year, may change the characteristics of the sample.

As seen on Table 3, children in the program all three years (group one), the first two consecutive years (group two), or the second two consecutive years (group three), or in the HLC only (group seven) scored significantly higher on the Stanford-Binet than the control group (group eight). The differences are 7.2 points, 9.4 points, 6.2 points, and 5.6 points respectively. These scores are three years after intervention was completed (in group one, three, seven), and four years after group two was in a home visit program. These differences are statistically significant,

Table 3

Means and Standard Deviations for Stanford-Binet at Age 6 by Number of Years and Timing of Participation in the Stimulation Program

| | | | Stanford-Binet | |
|---|---|---|---|---|
| Group | Years | N | $\bar{X}$ | SD |
| 1 | all 3 | 26 | 95.8** | 13.3 |
| 2 | first 2 | 11 | 98.0* | 12.7 |
| 3 | second 2 | 8 | 94.8* | 6.7 |
| 4 | first & third | 9 | 90.4 | 10.0 |
| 5 | first only | 11 | 91.3 | 14.4 |
| 6 | second only | 13 | 90.5 | 13.0 |
| 7 | HLC | 50 | 94.2** | 12.7 |
| 8 | controls | 51 | 88.6 | 10.2 |

**Higher than control, $p < .01$, one-tailed.
*Higher than control, $p < .025$, one-tailed.
Total N=179.

but they are not large in the absolute sense. However, it should be remembered that they occurred three years after the end of the treatment, a treatment that was only minimal and being developed at the time it was in operation.

Table 4 gives the data for children who have been tested on each occasion since age two. At age two, there are no significant differences among the eight groups, except that group four is lower than the other seven groups. For group one, the means are significantly greater than group eight, the control group, at ages three, four, five and six. For group two, the means are significantly greater than the control group at age four and six. Group seven is significantly greater than the control group at ages four and six. Thus, the differences that appear at age six are present earlier, but are not present at all ages. For some years, the differences between the means of treatment and control groups, while approaching significance, do not qualify as statistically different. It might be noted that the restricted sample in Table 4 (those that had every test since age two), gives higher means for the control group than on Table 3. This makes it more difficult to reach significance between treatment groups and control groups. Note also that the variance has become more stabilized, and that the standard deviations at age six are less than the usual standard deviation of 16 on this test. The groups are more homogeneous than expected. The data indicate that those in the program for three years or two consecutive years (groups two and three) or in for the third year only have higher means than the control group.

Discussion

The data presented above indicate that this series of projects had long-term effects on the children. Basic questions lying behind the series of

Table 4

Means and Standard Deviations on Stanford-Binet at Ages 3, 4, 5 and 6 and Bayley at Age 2 by Number of Years and Timing of Participation in the Stimulation Program

| Group | Years | N | Age 2 | | Age 3 | | Age 4 | | Age 5 | | Age 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD |
| 1 | all 3 | 20 | 87.2 | 14.1 | 98.1* | 16.7 | 98.4** | 21.3 | 98.4* | 13.6 | 97.4** | 12.1 |
| 2 | first 2 | 10 | 83.7 | 12.7 | 93.2 | 14.9 | 98.7* | 11.5 | 93.7 | 11.1 | 99.5** | 12.3 |
| 3 | second 2 | 8 | 86.8 | 5.9 | 97.5 | 12.8 | 99.1** | 11.8 | 94.0 | 13.4 | 94.8 | 6.1 |
| 4 | first & third | 7 | 80.0 | 8.6 | 91.0 | 10.6 | 90.6 | 14.3 | 93.6 | 13.7 | 89.6 | 11.4 |
| 5 | first only | 9 | 86.3 | 14.3 | 91.7 | 8.8 | 97.4 | 15.5 | 101.6* | 14.0 | 94.4 | 12.1 |
| 6 | second only | 10 | 91.9 | 17.7 | 91.5 | 10.6 | 86.7 | 12.8 | 90.4 | 14.7 | 93.4 | 13.5 |
| 7 | HLC | 37 | 87.6 | 14.9 | 96.5 | 13.7 | 96.3* | 11.6 | 93.0 | 19.7 | 95.5** | 11.9 |
| 8 | controls | 41 | 89.3 | 14.1 | 92.0 | 10.9 | 90.5 | 12.3 | 91.5 | 11.2 | 90.2 | 10.1 |
| | Total | 142 | | | | | | | | | | |

**Significantly greater than control at .025 for one-tailed test.
*Significantly greater than control at .05 for one-tailed test.

longitudinal efforts between three months and three years of age were the relative contributions of length of time (one, two or three years) and order of time (first, second or third year, combinations of two years) to the effects on children and parents. We can infer from the data that the most effective results were achieved with those families who were in the program continuously from the child's age three months through three years. The effects on the children in terms of Stanford-Binet scores at age six show that this group consistently exceed the control population and have maintained a steady level over the last three years.

The next set of effects seem to be most pervasive for the children who were in for two consistent years, either the first two or the last two years from three months to 24 months or 12 months to 36 months. Children who were in for both the first and third year do not show superiority to the control population. When we turn to those who were in for only one year, the data at age six indicate the superiority of the HLC combined approach of home visits and small group over control. Neither of the other one year efforts show this. However, it should be remembered that the children who were in for the first year of life were out of the program for five years, whereas the children who were in the HLC were out of the program only three years. Further, when we examine the results at age five, it is clear that there are lasting results for participation in the first year of life only.

It is also evident from all our data that our program in the second year of life only (12 to 24 months) was an ineffective effort. We have commented in other places (Gordon, 1969, 1973) that this may have been due to several factors such as the focus on motor development in the early part

of the second year of life, the nature of the activities may not have been as useful as in the first year and the fact that the mothers may not have seen gains that are so easily seen in the first year. We would suggest that intervention programs consider work for a minimum of two years and possibly longer if they wish to achieve some long-lasting gains for the family.

To what do we attribute the lasting effects on children? We have no clear data but we would speculate that the sustaining of gains on the Stanford-Binet for at least three years after the end of the program should not be attributable to any of the activities per se. Because we see the attitudes and behaviors of the mothers as critical, we would speculate that the gains are due to the changes in maternal attitudes and feelings about education, about the child and about themselves. It is these that contribute to maintenance of the differences between experimental and control.

An analysis of the correlations between parent and child measures which was done but is not presented here, shows how important maternal attitude is in influencing child intellectual performance. Since most of this analysis was done within the experimental group, these are influences over and above the program itself.

The longitudinal program was successful. The concept of a paraprofessional home visitor recruited from the community and working on a one-to-one basis with parents at home seems to be a useful and successful one. Further, the amount of intervention in these projects, because of the nature of the research design and our desire not to have extrensic reinforcements via comprehensive services or the possibility of one interpreting threat of loss of service as requirement for participation, was limited. Homes were visited only once a week; in fact, visits were made two weeks

out of three. The time spent in each visit was usually less than an hour. The information conveyed was demonstration of simple activities and the encouragement of the mother to not only use these during the week, but to develop her own. Few materials were provided and the mothers were shown ways to make their own. Further, we were developing the program while we were implementing it, so that there were supervisory, training and conceptual errors made during the course of the years. Nevertheless, in spite of the limited approach, the development problems and the lack of comprehensive services, we feel quite confident we can state that the effort was successful.

Further Research

Any program of research always suggests additional research. The answering of one set of questions leads to the development of a new set. First, although it is clear that the effects of this program last through kindergarten, it seems to us important that these families and children be followed so that we can see whether the effects persist in the early school years. There should be no reason to expect that the effects will last forever. Life is far too situational. We cannot expect the results of any program to persist without some reinforcement in society and school. We noted that the parents seem more educational oriented and more involved and the children certainly were functioning at a somewhat higher level than controls. However, all this can be turned around in school. One purpose of the National Follow Through program was to sustain effects of Head Start. We need longitudinal studies of programs such as ours to see what the natural effects are which may suggest to us additional intervention strategy.

The analyses of the relationships between maternal and child variables also indicate the need for much more multi-variant study of the

relationships between family variables and child performance within experimental groups. All intervention programs have made general assumptions about the group being served and have tended to deliver the same service or same program to each child or each family. Yet, we are all aware of the problem of the match, the issue of subject by treatment designs or the notion of aptitude treatment interaction. More careful fine-grained analyses of the entry behaviors of parents and children related to the activities and program and then to outcomes are needed. We are at a point where programs such as ours and others have demonstrated the general effectiveness of the concept of home visitation and the utility of paraprofessionals as workers with families. We now need more programs which use rifle rather than shotgun approaches.

It was also clear that there are wide differences of teaching style within the group. Our work in Follow Through, and the responses to our materials, supports the view that these differences exist in other populations, such as the middle class. We need further research on both parent education and parent-child transactions in all segments of our society. We also need data on the way society supports or negates the role of the family in child development.

In summary, this project, combining elements of field research, program development and materials development demonstrated that such work can contribute to not only our scientific knowledge but also our implementation capacity. It is a demonstration of the link between child development and social policy.

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